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Hepatic Dysfunction and Biochemical Abnormalities in Typhoid Patients

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ABSTRACT

Objective: To study biochemical abnormalities and hepatic dysfunction in typhoid patients.

Place and Duration of Study: This study was carried out from March to July 2018 in Lahore.

Materials and Methods: 200 patients were included in the study having typhoid fever and 100 individuals as control group. Positive serum of typhoid was taken with evident agglutination at 1:320. For performing widal test, the rising titre was used in order to avoid false positive. The patients had positive Typhi dot. Furthermore, the fever pattern was step ladder rising.The chemical analyser performed Aspartate transaminase (AST), Alanine transaminase (ALT), Bilirubin and serum Albumin on samples of these patients.

Results: 55 patients of the study were having increased ALT, value of mean was 99 ± 11.533 U/L. half of the patients were having increased AST and value of the mean of 111 ±14.454 U/L. 20% patients were having increased Serum bilirubin with mean 4.9 ±2.351 mg/dl. 26% patients had low Serum albumin and the value of mean was 2.6 ± 1.353 g/dl. Significantly among the typhoid patients as compared to control group, AST, ALT and serum bilirubin were atincreasedlevel and serum albumin was at decreased level.

Conclusion: The conclusion of the study was drawn that typhoid fever is connected withincreased transaminases and bilirubin level and also the levels of low serum albumin. As a matter of fact, typhoid fever is quite common in society along with other infections, therefore, any patient having fever and above-stated biochemical abnormalities he must undergo screening for typhoid feverin order to have effective and prompt treatment and also to decrease the mortality and morbidity connected with the illness.

Key Words: Bilirubin, increased AST, ALT, Typhoid fever

INTRODUCTION

Salmonella typhi is causing typhoid fever which is a systemic bacterial infection. Its development begins with food ingestion and contaminated water with organism. The period of incubation is 6 to 14 days. In developing countries, it is a serious health issue and across the world it has 16 million effectees and causing the death of 69,000 people annually. Typhoid fever is a disease which affect multi organs and is also connected with haematological abnormalities, gastro-intestinal perforation and hepatitis with cholestasis. The involvement of hepatic has been reported in typhoid fever among 23 to 60% patients. The involvement of hepatic differs from mild increase of amino transferases to a level different from severe viral hepatitis. The typhoid fever has been reported tohas involvement of fulminant hepatitis. Hepatic granulomas case has also been identified. Typhoid fever is connected with important biological and haematological alteration and hepatic dysfunction is a proof of increased liver enzymes. In typhoid fever the complication occurs in 10 to 15% cases, perforation and typhoid encephalopathy are quite serious among the following gastro-intestinal bleeding. Other complications are peritonitis, septicaemia, cholestasis, metastatic, osteomyelitis, endocarditis and rash. There is 1% mortality rate if the treatment is initiated before the beginning of complications and chances of mortality is 15% if the treatment is initiated before the beginning of complication. The object of this research is to assess in patients the hepatic dysfunction and biochemical abnormalities visiting for typhoid fever. In the developing countries the typhoid is a main health issue and there is increased risk of contracting illness therefore any patient visiting for deranged liver enzymes and clinically any patient has typhoid fever sign and symptom he must undergo screening for typhoid fever immediately for the purpose of diagnosing and quicktreatment to decrease the complication of illness and therefore decrease the morbidity and mortality: Changes in biochemical are transient and removes from the patient after having treatment on time.

MATERIALS AND METHODS

This study was carried out from June 2016 to June 2017 in Lahore. The research was conducted over 200 patients. 100 patients were included as a control group. Typhoid test, Widal test and clinically based on step ladder fever pattern was used for diagnosing the typhoid fever.Positive serum of typhoid was considered as with evident agglutination at1:320. For performing widal test, the rising titre was used in order to avoid false positive.100 ^{0} F temperature had been defined for

fever. Patients were removed from the study relying the medical history, laboratory investigation and examination who were having temperature due to severe viral hepatitis, malaria, pneumonia and urinary tract infection. Blood sample in gel-tube were collected from typhoid patients.There was determination of Serum AST, Serum ALT, Serum Bilirubin and Albumin. Microlab 300 conducted these tests. Results were subjected to statistical analysis. Value of P was less than 0.005 considered as significant.

RESULTS

The research was conducted over 100 patients having typhoid fever. There were 60 male and 40 females in the study. There was a control group of 50 individuals in the study. There was determination or Aspartate Transaminase (AST),Alanine Transaminase (ALT),Serum Albumin and Serum bilirubin among all the patients. 20% patients were having increased Serum bilirubin with mean 4.9 ±2.351 mg/dl. 26% patients had low Serum albumin and the value of mean was 2.6 ± 1.353 g/dl. Significantly among the typhoid patients as compared to control group, AST, ALT and serum bilirubin were at increased level and serum albumin was at decreased level.

The current research has revealed that hepatitis dysfunction considerable result in typhoid fever and level of AST, ALT and bilirubin were considerably increased and serum albumin was at decreased level than the control group. Value of P for AST, ALT, Bilirubin and albumin is $P<0.00232$, $P<0.000121$, $P<0.0012$ and $P<0.00421$ respectively.

DISCUSSION

Salmonella typhi is causing typhoid fever which is a systemic bacterial infection. In the developing countries the two major reasons for the public health issue are the under estimation of the disease and poor hygienic conditions. There are many clinicopathological elements presented with typhoid fever. Sometimes it may be presented as fever unidentified origin. Normally in typhoid patients, the liver is involved and there is significant occurrence of hepatic dysfunction. In the current research the patients having typhoid fever were assessed for hepatic dysfunction. There was increase of ALT in 55% of patients whereas the values of serum bilirubin and AST increased in 20% and 50% respectively. Rasoolin Jad et al. carried out similar study that typhoid fever is connected with increased levels of AST and ALT and reported 72% and 60% rise in enzymes level. The increased ALT and AST has also been reported by Enemchuk Ben et al. in their research which is in line with the current research. The connection of typhoid fever with hepatomegaly and mildly deranged function of liver as witnessed by the increased AST and ALT levels has also been reported by Korohi et al.

In the current research the increase of bilirubin was found in 20% and in 25% case the serum albumin was found low. Kayode et al. has reported the similar observations that the typhoid fever is connected with increased level of bilirubin and low levels of albumin. Bernard et al. has also reported the likewise observations in their research. The common findings occurring in 21tp 60% typhoid fever cases are splenomegaly, hepatomegaly and moderate increase of transaminase level. However, the very rare incidence is the acute hepatic derangement. It differs from less than1% to 26%. Initially the involvement of hepatic in typhoid fever was reported by William. The hepatic damage mechanism is not known but the suggestion has been made that biochemical derangement of liver dysfunction is resulting from the liver attack by salmonella or endotoxin's high concentration that damages the hepatocytes. The proliferation of bacteria may be in hepatocytes and results in the production of cytokines that damage liver. Invariably hyperbilirubinemia, hepatitis with jaundice and low levels albumin have been report in typhoid fever. The similar observations have been reported in the current research wherein the level of albumin in 25% of patient was low. Increase in the level of bilirubin is chiefly because of canaliculi obstruction by inflated hepatocytes resulting in bile canaliculi rupture and increased conjugated bilirubin.

CONCLUSION

The conclusion has been drawn by the current study that typhoid fever is connected with hepatic dysfunction as shown by the increased level of AST, ALT serum bilirubin and low level of serum albumin. Typhoid fever alongwith viral hepatitis, tuberculosis, malaria etc. is a main health issues in the developing countries such as Pakistan. Any patient appears with hepatitis and increased liver enzymes must undergo screening for typhoid fever and all clinicians should be suspicious for instant diagnose and typhoid fever treatment. It will assist in reduction of complication further will assist in the reduction of morbidity and mortality.

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